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PATENT APPLICATION

ATTORNEY DOCKET NO. 10006278-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Pere OBRADOR

Confirmation No.: 3661

Application No.: 09/879,168

Examiner: Lee, Y. Y.

Filing Date: 06/13/01

Group Art Unit: 2621

Title: MULTI-RESOLUTION BOUNDARY ENCODING APPLIED TO REGION BASED STILL IMAGE AND VIDEO ENCODING

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PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 10/09/06.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120	☐ 2nd Month $450	☐ 3rd Month $1020	☐ 4th Month $1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $ 500. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant:	Obrador	Patent Application
Application No.:	09/879,168	Group Art Unit: 2613
Filed:	June 13, 2001	Examiner: Lee, Y. Young

For: Multi-Resolution Boundary Encoding Applied to Region Based Still Image and Video Encoding

APPEAL BRIEF

Table of Contents

I. Real Party in Interest

The assignee of the present invention is Hewlett-Packard Development Company, L.P.

II. Related Appeals and Interferences

There are no related appeals or interferences known to the Appellants.

III. Status of Claims

Claims 1-20 have been rejected. This appeal involves Claims 1-20.

IV. Status of Amendments

No amendments have been filed subsequent to the final rejection.

V. Summary of Claimed Subject Matter

Independent Claims 1, 11, and 14 of the present application pertain to various embodiments for multi-resolution boundary encoding applied to region based still image and video encoding. For example, independent Claim 1 (Independent Claim 11 recites a similar apparatus and Independent Claim 14 recites a similar computer readable medium) recites "A method for applying multi-resolution boundary encoding to region based still image and video encoding.

910 of Figure 9 and page 10 lines 8-10 of the specification describe dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected.

912 of Figure 9 and page 10 lines 11-18 of the specification describe encoding each of the plurality of the boundaries, whereby each of the plurality of the boundaries contains different resolution coefficients.

914 of Figure 9 and page 10 lines 19-22 of the specification describe decomposing each of the plurality of the regions in the original image into one or more subbands using a plurality of the boundaries with the highest resolution coefficients selected from among the plurality of boundaries that are detected.

924 of Figure 9 and page 10 lines 23-33 of the specification describe successively decomposing each of the plurality of the regions in a subband with lower resolution coefficients into one or more subbands using the plurality of the boundaries with lower resolution coefficients.

926 of Figure 9 and page 10 lines 34-37 of the specification describe transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients.

934 of Figure 9 and page 11 lines 4-16 of the specification describe successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients.

VI. Grounds of Rejection to Be Reviewed on Appeal

1. Whether Claims 1-20 are anticipated by Tulluri et al. (U.S. Patent No. 6,026,183 under 35 U.S.C. §102(b).

VII. Argument

1. Whether Claims 1-20 are anticipated by Tulluri et al. (U.S. Patent No. 6,026,183 under 35 U.S.C. §102(b).

Claim 1 is directed to a method for applying multi resolution boundary encoding to region based still image and video encoding including:

"dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected;

encoding each of the plurality of the boundaries, whereby each of the plurality of the boundaries contains different resolution coefficients."

Claims 11 and 14 recite limitations similar to those recited in Claim 1. Claims 2-10 depend from Claim 1, Claims 12-13 depend from Claim 11, and Claims 15-19 depend from Claim 14 and recite further limitations of the claimed invention.

In the final Office Action, the Examiner has referenced section 8 of the previous office action, paper number 4, dated 2/11/03 as the location of the rejection of Claims 1-20 under 35 U.S.C. §102(b) as being anticipated by Talluri et al. The Appellant respectfully disagrees with the Examiner. That is, the Appellant does not understand Talluri et al. to anticipate the features of Claims 1, 11 and 14.

According to the Federal Circuit, "[a]nticipation requires the disclosure in a single prior art reference of each claim under consideration" (W.L. Gore & Assocs. v. Garlock Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983)).

Appellant understands Talluri et al. at column 11 lines 35-55 to teach and anticipate applying the transform method to regions of interest, not just homogeneous regions which fill up the entire frame. Moreover, at Column 12 lines 12-17, Appellant understands Talluri et al. to teach and anticipate after decomposition, the encoder only sends information about values that lie within the subregions of interest to be coded. (emphasis added)

In contrast, the present features clearly state "dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected; encoding each of the plurality of the boundaries, whereby each of the

plurality of the boundaries contains different resolution coefficients." That is, the original image is divided and each of the plurality of boundaries is encoded. The present features do not limit the image encoding to "a region of interest" but instead focus on homogeneous regions which fill up the entire frame.

For this reason, Appellant respectfully submits that Talluri et al. is missing an essential element needed for a proper prima facie rejection. As such, Appellant respectfully submits the rejection under 35 U.S.C. §102(b) is improper and should be reversed.

In addition, Claim 1 also includes the feature:
"decomposing each of the plurality of the regions in the original image into one or more subbands using a plurality of the boundaries with the highest resolution coefficients selected from among the plurality of boundaries that are detected;

successively decomposing each of the plurality of the regions in a subband with lower resolution coefficients into one or more subbands using the plurality of the boundaries with lower resolution coefficients."

Claims 11 and 14 recite limitations similar to those recited in Claim 1. Claims 2-10 depend from Claim 1, Claims 12-13 depend from Claim 11, and Claims 15-19 depend from Claim 14 and recite further limitations of the claimed invention.

Furthermore, Appellant understands Talluri et al., at column 11 lines 4-7 and 35-38, to teach and anticipate performing wavelet transformations by successive stages of decomposition of an image. The transformations preferably only encode regions in the subbands which correspond to original regions of interest in the original image. FIGS. 10a-c heuristically illustrate how regions appear in the subband filtered outputs. This approach avoids spending bits outside of the regions of interest and improves video quality. The specific use for motion failure regions is a special case of only encoding regions of interest.

In contrast, the present features clearly state "dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected; encoding each of the plurality of the boundaries, whereby each of the plurality of the boundaries contains different resolution coefficients."

For this additional reason, Appellant respectfully submits that Talluri et al. is missing an essential element needed for a proper prima facie rejection. As such, Appellant respectfully submits the rejection under 35 U.S.C. §102(b) is improper and should be reversed.

In addition, Claim 1 also includes the feature:

"transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and

successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients."

Claims 11 and 14 recite limitations similar to those recited in Claim 1. Claims 2-10 depend from Claim 1, Claims 12-13 depend from Claim 11, and Claims 15-19 depend from Claim 14 and recite further limitations of the claimed invention.

According to the Federal Circuit, "[a]nticipation requires the disclosure in a single prior art reference of each claim under consideration" (W.L. Gore & Assocs. v. Garlock Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983)). However, it is not sufficient that the reference recite all the claimed elements. As stated by the Federal Circuit, the prior art reference must disclose each element of the claimed invention "arranged as in the claims" (emphasis added; Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)).

The Office Action states that Figure 15a and 15b are analogous to the claimed features of "transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients." However, Appellant respectfully disagrees.

Appellant understands Talluri et al., at column 18 lines 23-60, to teach and anticipate error correction utilizing two Reed-Solomon Coders (emphasis added).

In contrast, the present features clearly state "transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients."

Appellant respectfully submits that Talluri et al. is silent with respect to transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients (emphasis added).

For this additional reason, Appellant respectfully submits that Talluri et al. is missing an essential element needed for a proper prima facie rejection. As such, Appellant respectfully submits the rejection under 35 U.S.C. §102(b) is improper and should be reversed.

Regarding Claims 2-10, 12-13 and 15-20, Appellant respectfully submits that Claims 2-10, 12-13 and 15-20 are also allowable as pending from allowable base Claims and reciting further features of the Claimed invention.

For at least these reasons, Appellant respectfully asserts that the references, individual or combined do not teach or suggest the embodiments recited in independent Claims 1, 11, and 14 and their respective dependent claims. Moreover, Appellant respectfully submits that the Examiner's rejections of the Claims are improper as key limitations needed for proper prima facie rejections of Appellants' Claims are not met by the cited reference as outlined above. Moreover, because key limitations of independent Claims 1, 11 and 14 (from which Claims 2-10, 12-13 and 15-20 pend) are not anticipated by Talluri et al., Appellant respectfully submits that the rejection of Claims 1-20 under 35 U.S.C. §102 (b) as being anticipated by Talluri et al. is improper and should be reversed.

Conclusion

Appellant believes that pending Claims 1-20 are patentable over Talluri et al. Appellant respectfully requests that the rejection of Claims 1-20 be reversed.

Respectfully submitted,
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Dated: 2/26/07

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VIII. Claims Appendix

1. (Previously Presented) A method for applying multi-resolution boundary encoding to region based still image and video encoding, comprising:

dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected;

encoding each of the plurality of the boundaries, whereby each of the plurality of the boundaries contains different resolution coefficients;

decomposing each of the plurality of the regions in the original image into one or more subbands using a plurality of the boundaries with the highest resolution coefficients selected from among the plurality of boundaries that are detected;

successively decomposing each of the plurality of the regions in a subband with lower resolution coefficients into one or more subbands using the plurality of the boundaries with lower resolution coefficients;

transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and

successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients.

2. (original) The method of claim 1, wherein the encoding step includes encoding each of the plurality of the boundaries by two periodic wavelet series, whereby each of the plurality of the boundaries contains different resolution coefficients in each of the two periodic wavelet series.

3. (original) The method of claim I, wherein the decomposing step includes decomposing each of the plurality of the regions in the original image into four subbands using a region based subband encoding scheme.

4. (original) The method of claim 3, wherein the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using low pass horizontal and low pass vertical frequency filters.

5. (original) The method of claim 3, wherein the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using high pass horizontal and low pass vertical frequency filters.

6. (original) The method of claim 3, wherein the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using low pass horizontal and high pass vertical frequency filters.

7. (original) The method of claim 3, wherein the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using high pass horizontal and high pass vertical frequency filters.

8. (original) The method of claim 1, wherein the successively decomposing step includes successively decomposing for at least three levels of decomposition.

9. (original) The method of claim 1, further comprising reconstructing image information at a higher resolution in a receiver by combining the image information in the one or more lowest resolution subbands.

10. (original) The method of claim 9, further comprising successively reconstructing image information at a yet higher resolution in the receiver by combining the image information in the one or more lower resolution subbands, until the original image is reconstructed.

11. (Previously Presented) An apparatus for applying multi-resolution boundary encoding to region based still image and video encoding, comprising:

means for dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected;

means for encoding each of the plurality of the boundaries, whereby each of the plurality of the boundaries contains different resolution coefficients;

means for decomposing each of the plurality of the regions in the original image into one or more subbands using a plurality of the boundaries with the highest resolution coefficients selected from among the plurality of boundaries that are detected;

means for successively decomposing each of the plurality of the regions in a subband with lower resolution coefficients into one or more subbands using the plurality of the boundaries with lower resolution coefficients;

means for transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and

means for successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients.

12. (original) The apparatus of claim 11, wherein the means for encoding step includes means for encoding each of the plurality of the boundaries by two periodic wavelet series, whereby each of the plurality of the boundaries contains different resolution coefficients in each of the two periodic wavelet series.

13. (original) The apparatus of claim 11, wherein the means for decomposing step includes means for decomposing each of the plurality of the regions in the original image into four subbands using a region based subband encoding scheme.

14. (currently amended) A computer readable medium providing instructions for applying multi-resolution boundary encoding, to region based still image and video encoding, the instructions comprising:

dividing an original image into a plurality of regions, wherein a plurality of boundaries associated with the plurality of the regions is detected;

encoding each of the plurality of the boundaries, whereby each of the plurality of the boundaries contains different resolution coefficients;

decomposing each of the plurality of the regions in the original image into one or more subbands using a plurality of the boundaries with the highest resolution coefficients selected from among the plurality of boundaries that are detected;

successively decomposing each of the plurality of the regions in a subband with lower resolution coefficients into one or more subbands using the plurality of the boundaries with lower resolution coefficients;

transmitting boundary information associated with regions of the original image and image information with the lowest resolution coefficients; and

successively transmitting boundary information associated with regions of the original image and image information with higher resolution coefficients.

15. (original) The computer readable medium of claim 14, wherein the instructions for encoding step includes encoding each of the plurality of the boundaries by two periodic wavelet series, whereby each of the plurality of the boundaries contains different resolution coefficients in each of the two periodic wavelet series.

16. (original) The computer readable medium of claim 14, wherein the instructions for decomposing step includes decomposing each of the plurality of the regions in the original image into four subbands using a region based subband encoding scheme.

17. (original) The computer readable medium of claim 16, wherein the instructions for the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using low pass horizontal and low pass vertical frequency filters.

18. (original) The computer readable medium of claim 16, wherein the instructions for the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using high pass horizontal and low pass vertical frequency filters.

19. (original) The computer readable medium of claim 16, wherein the instructions for the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using low pass horizontal and high pass vertical frequency filters.

20. (original) The computer readable medium of claim 16, wherein the instructions for the decomposing step includes decomposing each of the plurality of the regions in the original image into a subband using high pass horizontal and high pass vertical frequency filters.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None